PEST MANAGEMENT GRANTS
FINAL REPORT

Contract Number: #97-0238

Contract Title: Central Coast Vineyard Team

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ACKNOWLEDGEMENTS

The Principal Investigators would like to thank all of the growers who volunteered participation in this project. Without such participation, the Positive Points System (PPS) would be nothing more than an academic exercise. The Central Coast Vineyard Team (CCVT) would also like to thank Larry Bettiga and Mary Bianchi (UCCE), Dr. Janet Broome (UC SAREP), and Dr. Keith Patterson (Cal Poly) for continued technical and advisory assistance to the group. Finally, we would like to extend a special thanks to all of the members of CCVT, past and present, who have volunteered valuable time, energy, and resources to promoting sustainable vineyard practices on the Central Coast.

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ABSTRACT

CCVT developed a PPS, which represents a 1,000-point system for evaluating the extent of sustainable practices utilized on vineyards. Ninety-eight evaluations were completed from 1996/98, involving 47 different growers and 60 different blocks. Thirty-two blocks were evaluated for multiple years to determine the change in management practices over time. Total acreage evaluated exceeded 10,500 acres (18.5% of the published acreage in the 3 counties). Average total scores increased from 750 to 817 from 1996/98. While average scores for water management and wine quality remained virtually unchanged, average scores for pest, soil, viticulture, and continuing education increased. Of the same blocks that were evaluated over time 19 scores increased, 6 scores stayed the same, and 7 scores decreased.

BODY OF REPORT

EXECUTIVE SUMMARY

CCVT represents a broad-based partnership of winegrape growers, consultants, wineries, university representatives, and cooperative extension on the Central Coast of California (Monterey, San Luis Obispo, and Santa Barbara Counties). The Team's mission is to identify and promote environmentally and economically sustainable vineyard practices while maintaining or improving the quality of winegrapes. CCVT developed the PPS, which represents a 1,000-point evaluation procedure for evaluating the extent of sustainable practices utilized in a given vineyard. From 1996 to 1998, 47 different growers have evaluated their blocks and 98 evaluations have been completed. Ten thousand five hundred acres were specifically evaluated using protocol, and more than 25,000 acres will likely be affected by the management identified by the score. Average total scores increased from 750 to 817 from 1996-98. While average scores for water management and wine quality remained virtually unchanged, average scores for pest, soil, viticulture, and continuing education increased. Thirty-two blocks were evaluated over multiple years. Of the blocks that were evaluated over time, 19 scores increased, 6 scores saw no change, and 7 scores decreased.

The differences between counties in their average scores for each category were small. The most significant difference between county scores had to do with soil management. Monterey County saw the largest increase in overall scores from 1996 to 1998. Santa Barbara County saw a slight decrease in average scores from 1996 to 1998, although their average score remains the overall highest of the three counties. When looking at each year individually, Monterey county growers had slightly lower scores that the other two counties probably because of the larger block/farms associated with Monterey County. Pest management scores are higher in 1998 than for previous years. This change can be attributed in part to a change in the protocol with respect to scoring the use of Category I chemicals. The remainder of this increase in score reflects a rise in the adoption of sustainable pest management practices and may also be an indication of a relatively low pest pressure year.

Vineyard age was responsible for some of the variation between block scores. Differences in vineyard age result in different viticultural practices. Newer vineyards (less than 10 years old) tended to use drip irrigation, resistant rootstock, and cover crops, which are practices that are known to improve yield and reduces losses due to pests. Unlike older vineyards (older than 20 years) newer vineyards do not need to rely as heavily on fungicides for disease control and may reduce the need for nematicides and insecticides in addition to increasing water use efficiency.

CCVT outlined several points with regard to general vineyard management on the Central Coast that show the potential for improvement. Specifically, they have identified soil management (composting and amendments), water management (water budgeting and irrigation scheduling) and pest management (knowledge of and monitoring beneficial insects) as areas to address through outreach. The evaluation revealed overall strong scores in the following areas: knowledge of pest, weeds and diseases (pest management); use/management of cover crops (soil management); wine quality (each subcategory was strong); continuing education (each subcategory was strong); and viticulture (scores were relatively high for each subcategory).

As a method of outreach, CCVT has developed PPS into a bound booklet for distribution to growers, public agencies and environmental groups. In 1998-99 PPS was also published in Practical Winery & Vineyard and was recognized in publications of Grape Grower and Wine Business Monthly. Other methods of outreach included workshops aimed to educate about PPS, an exhibit at the Grape Expo in Paso Robles, and presentations given at the Central Coast Wine Grower Association and CSU Fresno Viticulture Short Course in Santa Maria. Ongoing presentations were made in both beginning and advanced viticulture courses at Cal Poly, San Luis Obispo. CCVT has distributed other literature to include general information on CCVT, Sustainable Agriculture, Cooperating Grower Newsletters, Winegrape Growers Newsletters, Grower Experiences with Soil/Water/Tissue Testing. Using a "grower-to-grower" method of outreach provides the primary extension model and has been extremely successful in presenting "sustainable" messages to growers who might not otherwise be receptive.

As an educational tool, PPS helps winegrowers pinpoint areas where improvements can be made. Findings from the PPS evaluation helped participants to direct future efforts in vineyard management and planning. Team member Richard Smith explains below:

After evaluating our operation with the PPS, we learned that the area of soil management needed attention. We have since made a commitment towards improving our soil management program as a priority. Our new cover crop and soil amendment program addresses several issues: low organic matter soils, high erosion fields, water penetration issues, and mite problems. In fact, the results of our efforts have supported our refocused commitments. Our mite problem has been virtually eliminated by controlling dust. Organic matter is increasing and water penetration is improving. Even during El Nino, we experienced minimal erosion. The soil's structural and nutritional health is improved. We have measured positive yield responses, and we have seen improved growth and wood maturity.

Interest in the group continues to expand, both with growers, educational groups, environmental interests, wineries, and other parties throughout the State. The recent hiring of an Executive Director will help focus the Team's efforts promote sustainable vineyard practices on the Central Coast.

INTRODUCTION

During the first year of this project, CCVT created a vineyard PPS with support from DPR and matching support from the team members. This PPS is the first description of a regionally specific integrated vineyard management system in California. Team members based on their own experience as successful vineyard managers developed the system. Technical input from University of California Cooperative Extension (UCCE) Farm Advisors and Sustainable Agriculture Research and Education Program (UC SAREP) staff and UC publications was used in the development of the PPS (Flaherty et al, 1992). The PPS as a point system is loosely based on the Massachusetts program Partners with Nature (Autio et al, 1992) and the Swiss Integrated Production System (Boller, 1990). The protocol has been modified several times as it incorporated input from various sources.

The PPS can be used to describe and then measure grower environmental enhancement by scoring farming practices in the following categories: pest management, water management, soil management, viticulture management, wine quality and continuing education. Increases in scores from one year to the next indicate the adoption of more environmentally friendly farming practices. The PPS was also designed to be an educational tool for growers to pinpoint areas of management that are in need of attention.

The Team's efforts also included outreach and education. Meetings, presentations, distribution of grower-friendly materials, and displays at industry conferences provided the basis for outreach for both transitional and traditional growers.

The team forged ties through meetings with representatives from the Monterey Bay National Marine Sanctuary Program, National Fish and Wildlife Foundation, San Luis Obispo County Health Commission, U.S. Department of Agriculture (USDA) Natural Resource Conservation District, Regional Water Quality Control Board, Environmental Center of San Luis Obispo (SLO) County, Community Alliance of Family Farmer's, and the SLO County Agricultural Commissioner.

CCVT recently hired a part-time executive director to facilitate team objectives and increase the efficiency of outreach efforts.

MATERIALS AND METHODS

Over three years, 98 evaluations were completed which included more than 10,500 acres. Fourty-eight different growers participated in the project, and 60 different blocks were evaluated. A wide variety of vine-age, and block sizes are represented by the evaluated blocks (Table 1 and 2).

Table 1. Evaluated Blocks' Vine Age

Vine Age (years)	Number of Blocks
< 3	12
3 – 10	19
11-20	14
>20	15
Total	60

Table 2. Evaluated Blocks' Size

Farm Size (acres)	Number of Blocks
<99	27
100-499	17
500-999	10
>1000	6
Total	60

Twenty-nine blocks were evaluated for 1 year only, and 32 blocks were evaluated for multiple years (Table 3).

Table 3. Distribution of Blocks and Number of Years Evaluated

	Number of Years that Blocks Were Evaluated Within Each County			
	Number of Years			
County	1	2	3	Total
Monterey	3	6	6	15
San Luis Obispo	13	11	0	24
Santa Barbara	13	8	1	22
Total	29	25	7	61

There are several reasons why a block may have only been evaluated once: new grower in 1998, "test" block for a grower, or ownership change. In a few cases, the growers did not want to continue for varied reasons. In 1999, team members will follow up with those growers to encourage them to participate again.

Team members evaluated nineteen blocks. Evaluations of non-team member blocks were completed by interview whenever possible. The interview method was the preferred method for gathering information and was used. In some cases, there were logistical constraints to using the interview method.

Interviews with growers lasted from one to three hours. This time was spent discussing practices specific to the grower's operation. This information becomes the foundation for grower testimonials utilized for written communication and presentations to other growers. Due to the size of the Central Coast, travel time to and from interviews could be significant. For example, a full day would be required to complete two evaluations in Monterey County. This does not take into account the time needed to coordinate an interview, and to enter and analyze the data. Grower input was gathered during the 1996/97-interview process and incorporated into the PPS revision in early 1998.

This project also incorporated outreach in various forums: industry publications, handout materials, and meetings/presentations. The following lists identify the types of outreach efforts.

Grower Name:_____ **Date:**_____

Vineyard Name: _____ **Block(s)** _____

Vineyard Address/Location: _____

Mailing Address: _____

Phone: _____ **Fax:**_____

Acreage of Block(s) Being Scored _____ **Total Acreage At This Location** _____

Age of Vines being scored _____ **County**_____ **Version:**_____

Begin each category by answering the questions in order by section and number. First read the goal for each section, and if you take the full points, skip to the following section. If you do not take the full points, answer each question in the section. Enter number of points earned per question. A "yes" answer gains the designated points, and a "no" answer gains zero.

I. Pest Management **200 Total Points Possible**

Section A	Section B	Section C	Section D	Section E	Total Points Earned
1. (7)	1. (6)	1. (7)	1. (7)	1. (4)	
2. (4)	2. (4)	2. (5)	2. (7)	2. (4)	
3. (4)	3. (5)	3. (4)	3. (5)	3. (4)	
4. (4)	4. (4)	4. (4)	4. (5)	4. (4)	
5. (4)	5. (4)	5. (4)	5. (5)	5. (4)	
6. (4)	6. (4)	6. (5)		6. (25)	
7. (4)	7. (4)	7. (6)			
8. (4)		8. (5)			
9. (4)		9. (4)			
10. (4)					
11. (4)					
12. (4)					
Total	Total	Total	Total	Total	
(51)	(31)	(44)	(29)	(45)	

II. Soil Management **200 Total Points Possible**

A	B	C	D	E	F	G	Total Points Earned
1. (8)	1. (5)	1. (4)	1. (7)	1. (6)	1. (9)	1. (7)	
2. (7)	2. (4)	2. (5)	2. (6)	2. (5)	2. (6)	2. (7)	
3. (7)	3. (4)	3. (5)	3. (6)	3. (6)	3. (6)	3. (7)	
4. (7)	4. (4)	4. (4)	4. (5)	4. (6)	4. (6)	4. (7)	
5. (7)	5. (4)	5. (4)	5. (5)	5. (5)			
	6. (4)		6. (5)				
Total	Total	Total	Total	Total	Total	Total	
(36)	(25)	(22)	(34)	(28)	(27)	(28)	

III. Water Management 200 Total Points Possible

Section A	Section B	Section C	Section D	Section E	Total Points Earned
1. (14)	1. (6)	1. (8)	1. (8)	1. (6)	
2. (14)	2. (5)	2. (8)	2. (8)	2. (6)	
	3. (5)	3. (8)	3. (7)	3. (6)	
	4. (6)	4. (7)	4. (8)	4. (6)	
	5. (6)	5. (7)	5. (8)		
		6. (5)	6. (8)		
		7. (5)	7. (7)		
		8. (8)	8. (10)		
Total	Total	Total	Total	Total	
(28)	(28)	(56)	(64)	(24)	

IV. Viticultural Management 200 Total Points Possible

Section A	Section B	Section C	Section D	Total Points Earned
1. (12)	1. (8)	1. (10)	1. (8)	
2. (12)	2. (7)	2. (10)	2. (8)	
3. (12)	3. (7)	3. (10)	3. (10)	
4. (14)	4. (6)	4. (20)	4. (8)	
	5. (6)		5. (10)	
	6. (6)		6. (6)	
	7. (10)			
Total	Total	Total	Total	
(50)	(50)	(50)	(50)	

V. Wine Quality
100 Total Points Possible

Section A	Section B	Total
1. (8)	1. (10)	Points Earned
2. (8)	2. (10)	
3. (8)	3. (20)	
4. (8)	4. (10)	
5. (10)		
6. (8)		
Total	Total	
(50)	(50)	

VI. Continuing Education
100 Possible Points Total

Section A	Section B	Section C	Total
1. (7)	1. (5)	1. (11)	Points Earned
2. (7)	2. (5)	2. (11)	
3. (7)	3. (5)	3. (10)	
4. (12)	4. (5)		
	5. (5)		
	6. (5)		
	7. (5)		
Total	Total	Total	
(33)	(35)	(32)	

Cumulative Points for all Categories 1,000 Total Points Possible

Category	Points Earned	Points Possible
I. Pest Management		200
II. Soil Management		200
III. Water Management		200
IV. Viticultural Management		200
V. Wine Quality		100
VI. Continuing Education		100
Total		1,000

Typical Ranges of Points Earned:

- Older Vineyards (10 years +) 500-700 points
  (Present manager did not make pre-plant decisions)

- Newer Vineyards (<10 years) above 700 points
  (Present manager did participate in pre-plant decisions)

Industry Publications
Wine Business Monthly 3/99
Grape Grower 1/99
Practical Winery and Vineyard 3/98

Meetings/Presentations
Grower Workshops: Arroyo Grande, Paso Robles, Monterey 3/98
Grape Expo: Presentation and Exhibit 12/98
Central Coast Wine Grower Association: Grower Testimonial Presentation 3/99
Viticulture Conference: Grower Testimonial Presentation 4/99

Handout Materials
CCVT Booklets, 1998 to present, (400 distributed)
CCVT Tri-fold, 12/98 to present (250 distributed)
Sustainable Agriculture Flyer, 12/98 to present (250 distributed)
Newsletter for Cooperating Growers, 1/99 to present (100 distributed)
Newsletter for Winegrape Growers, 3/98 to present (750 distributed)
Testimonial of Soil/Water/Tissue Test, 3/99 (50 distributed)

The team involved participation through meetings with representatives from various groups and agencies: the Monterey Bay National Marine Sanctuary Program, National Fish and Wildlife Foundation, San Luis Obispo County Health Commission, USDA Natural Resource Conservation District, Regional Water Quality Control Board, Environmental Center of SLO County, Community Alliance of Family Farmer's, and SLO County Agricultural Commissioner. During the last year, CCVT has become an important contact for people inquiring about vineyards on the Central Coast. The Team has provided and will continue to provide representation in regional processes involving Farm Worker Safety, Irrigated Agriculture Short Course, and National Resource Conservation Service habitat discussions.

RESULTS

Average scores for all three counties increased from 751 to 817 from 1996-98 through the use of the PPS. Water and wine quality categories remained virtually unchanged; pest, soil, viticulture and continuing education categories' scores increased (Table 4, Figure 1). The absolute minimum scores also increased for pest, soil, viticulture, and continuing education. Remember, not all of these blocks are the same.

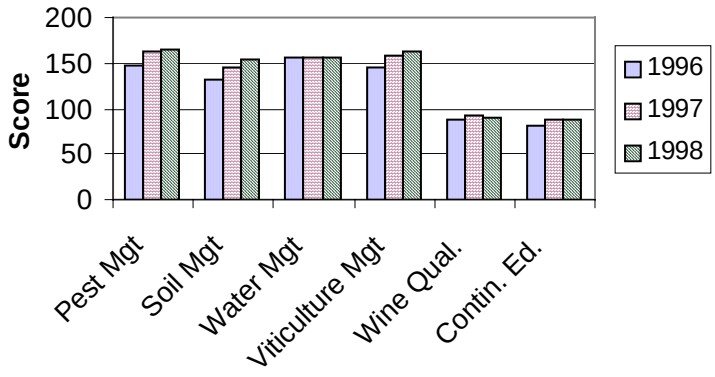
Table 4. PPS Scores for Central Coast (96/98).

Year	Statistic	Category						
		Pest	Soil	Water	Viticulture	Wine Qual.	Contin. Ed.	TOTAL
1996	Average	148	132	156	145	89	81	751
	Minimum	86	44	7	38	0	23	359
	Maximum	193	200	200	200	100	100	959
1997	Average	162	146	156	159	93	87	802
	Minimum	124	85	0	66	0	10	470
	Maximum	200	200	200	200	100	100	980
1998	Average	165	153	157	163	90	88	817
	Minimum	130	113	0	70	0	50	579
	Maximum	200	200	200	200	100	100	958

Note: Data reflects every evaluation recorded and does not isolate blocks evaluated over time.

Table 5. Distribution of PPS for Each County (96/98)

	1996			1997			1998			Total
Score	M	SLO	SB	M	SLO	SB	M	SLO	SB	
<600	1	1	0	2	0	1	1	0	0	6
600-699	2	3	2	1	1	1	0	1	1	12
700-799	5	3	4	1	3	2	3	2	5	28
800-899	2	1	1	5	7	5	4	7	5	37
>900	1	1	2	2	2	2	3	2	1	16
Total	11	9	9	11	13	11	11	12	12	99



Note: Data reflects every evaluation recorded and does not isolate blocks evaluated over time.

Figure 1. Change in Average Scores for Each Category

When looking at evaluations of the same block over time, Monterey and Santa Barbara County performed better than San Luis Obispo County. In Monterey, 8 blocks increased their scores, 1 block saw no change, and 3 blocks' scores decreased. In San Luis Obispo County, 3 blocks' scores increased, 4 stayed the same, and 4 blocks' scores decreased. In Santa Barbara County, 8 scores increased, 6 remained the same, and none of the blocks' scores decreased (Table 6).

Table 6. Changes in Scores For Blocks Evaluated Over Time

Change in Score (points)	County			Total
	M	SLO	SB	
< -50	1	1	0	2
0 to -50	2	3	0	5
no change	1	4	1	6
0 to 50	3	1	0	4
51 to 100	2	0	4	6
>100	3	2	4	9
Total	12	11	9	32

When looking at evaluations of the same block over time, average change in score was an increase of 49 points. The greatest change in score for these blocks was an increase in 277 points, although this increase was partially attributed to the vineyard coming into production and the associated scores with wine quality. One vineyard showed a decrease in score of 189 points. This was accounted for by overall changes in pest, viticultural, wine quality, and continuing education. When examining blocks scored over time, 83%, 36%, and 67% of the pest management scores increased for Monterey, San Luis Obispo, and Santa Barbara Counties (**Table 7**). The percentage of blocks increasing their water and soil scores was the highest in Santa Barbara County (56% and 67%).

Table 7. Blocks Evaluated Over Time

Category	Change in Score	Monterey		San Luis Obispo		Santa Barbara		All Counties	
		Number	%	Number	%	Number	%	Total	%
Pest	Increase	10	83.3	4	36.4	6	66.7	20	62.5
	No Change	1	8.3	4	36.4	1	11.1	6	18.8
	Decrease	1	8.3	3	27.3	2	22.2	6	18.8
Soil	Increase	7	58.3	5	45.5	6	66.7	18	56.3
	No Change	4	33.3	4	36.4	1	11.1	9	28.1
	Decrease	1	8.3	2	18.2	2	22.2	5	15.6
Water	Increase	4	33.3	4	36.4	5	55.6	13	40.6
	No Change	4	33.3	5	45.5	2	22.2	11	34.4
	Decrease	4	33.3	2	18.2	2	22.2	8	25.0
Viticulture	Increase	5	41.7	5	45.5	4	44.4	14	43.8
	No Change	3	25.0	4	36.4	2	22.2	9	28.1
	Decrease	4	33.3	2	18.2	3	33.3	9	28.1
Wine Quality	Increase	0	0.0	2	18.2	2	22.2	4	12.5
	No Change	10	83.3	7	63.6	6	66.7	23	71.9
	Decrease	2	16.7	2	18.2	1	11.1	5	15.6
Cont. Ed.	Increase	4	33.3	3	27.3	2	22.2	9	28.1
	No Change	4	33.3	5	45.5	4	44.4	13	40.6
	Decrease	4	33.3	3	27.3	3	33.3	10	31.3
Total	Increase	8	66.7	3	27.3	8	88.9	19	59.4
	No Change	1	8.3	4	36.4	1	11.1	6	18.8
	Decrease	3	25.0	4	36.4	0	0.0	7	21.9

Average scores for Monterey County were slightly lower than those scores for San Luis Obispo and Santa Barbara Counties (Table 8), though the differences between counties in their average scores for each category were small. The greatest difference between county scores concerned soil management. The average score for soil management was 135 for Monterey County and 150 for San Luis Obispo County.

Table 8. Regional Differences in PPS Scores (1996-98 Combined)

County	Parameter	Pest	Soil	Water	Viticulture	Wine Quality	Continuing Ed.	Total
Monterey	average	153	135	158	153	96	79	773
San Luis Obispo	average	159	150	152	161	83	87	792
Santa Barbara	average	162	143	162	150	90	91	798

Monterey County saw the largest increase in overall scores from 1996/98 (Table 9). Santa Barbara County saw a slight decrease in average scores from 1996 to 1998.

Table 9. Change in Scores by County and Year

County	Year	Pest	Soil	Water	Viticulture	Wine Quality	Continuing Education	Total
Monterey	1996	137	126	152	141	96	77	730
	1997	156	131	157	156	95	80	774
	1998	165	147	164	161	97	80	813
San Luis Obispo	1996	144	128	151	141	71	79	715
	1997	169	157	148	167	92	90	823
	1998	165	165	155	174	87	90	837
Santa Barbara	1996	161	139	167	148	98	87	801
	1997	160	146	165	151	90	90	804
	1998	164	142	152	151	88	94	791

Note: Data reflects every evaluation recorded and does not isolate blocks evaluated over time.

On a county average, Monterey County saw the greatest increase in pest and water management scores. San Luis Obispo County saw the greatest increase in viticulture, soil, wine quality and continuing education scores. Overall scores increased 83 and 123 points for Monterey and San Luis Obispo Counties from 1996/98. Overall scores for Santa Barbara County decreased by 10 points (Figure 2).

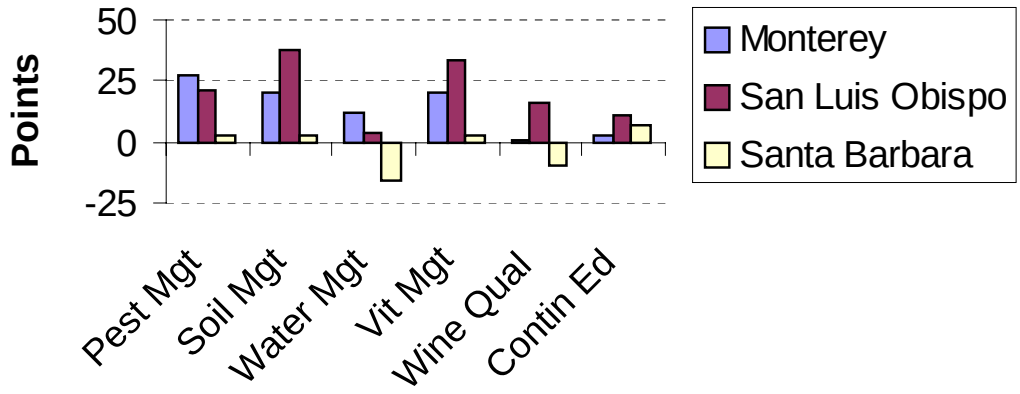


Figure 2. Changes in Score for Each Category and County

DISCUSSION

Evaluations

When examining scores that combined each year, Monterey County growers have slightly lower scores than the other two counties. This is probably attributed to larger block/farm sizes associated with Monterey County. When looking at the three years combined, variations between regions and categories do not appear to be significant. It seems that these differences are becoming less significant though with time. Also, as scores become higher, there is less room for improvement. This perhaps can explain the slight decrease in overall high scores in Santa Barbara County.

When looking at each year individually, Monterey County scores were slightly lower than other counties for most categories, although these differences did not seem significant. The smallest difference in score appeared in the pest management category. In general, the growers interviewed in each county were fairly similar in their attention to pest management in 1996, 1997, and 1998.

The 1998 Pest Management scores are higher than for previous years. Part of this increase can be attributed to a change in the protocol regarding scoring the use of Category I chemicals. This only accounts for a portion of the respondents. The remainder of the increase can be attributed to a rise in the adoption of sustainable pest management practices, or perhaps it is an indication of a relatively low pest pressure year.

Differences in scores are also related to differences between the ages of the vineyards examined. Differences in vineyard age can result in different viticultural practices. Bearing vineyards less than 10 years old were considered to be “newer vineyards” and those vineyards that are older than 20 years were described as “older vineyards.” New vineyards tend to have drip irrigation, resistant rootstock, and cover crops, which are practices that have been shown to improve yield and reduce losses due to pests. In particular, these kinds of practices reduce the need to rely as heavily on fungicides for disease control, may reduce the need to use nematicides and insecticides, and increase water use efficiency.

When reviewing the data for a block whose score decreased over time, certain ambiguities were noticed in the protocol. For example, one grower took credit in 1996 for retrofitting his trellis design to reduce disease problems, but did not claim this credit again in 1997 (10 pts). This grower also did not claim credit for rating his canopy after harvest in 1997 because he believed that he should have been doing this throughout the year (10 pts). Although this does clearly demonstrate the level of honesty encountered when rating vineyards with growers, it also demonstrates the continuing need to improve the PPS by addressing such issues.

Two dry farmed vineyards were evaluated using the PPS in initial scoring of vineyards. Although there are few dry farmed vineyards in the region, it is interesting to note that these farms did not score as well. The PPS gives points for activities such as water management and conservation that are not pertinent to a dry farmed vineyard. The extremely low minimums in the water management category were those of dry farmed vineyards.

Extremely low scores for wine quality were attributed to non-bearing age where the wine quality section did not apply. Several points deserve mention with regards to general vineyard management on the Central Coast.

The following issues show potential for improvement and should be addressed through outreach:
1. Soil management-composting and amendments
2. Water management-water budgeting, moisture monitoring and irrigation scheduling
3. Pest management-knowledge of and monitoring beneficial insects

The following issues were commonly recognized as strong areas in the evaluation:
1. Pest Management- scores relating to knowledge of pest, weeds and diseases were high
2. Soil Management-scores relating to the use/management of cover crops were strong
3. Wine Quality-scores in each subcategory were strong
4. Continuing Education- scores in each subcategory were strong
5. Viticulture-scores were relatively high for each subcategory

Outreach

The PPS was developed into a bound booklet for distribution to growers, public agencies, and environmental groups. This booklet will be revised this year with updates on goals and accomplishments of the group. The PPS was also published in Practical Winery & Vineyard (May/June, 1998). The CCVT and PPS were also recognized in publications of Grape Grower (January, 1999) and Wine Business Monthly (March, 1999).

Grower workshops were held in Arroyo Grande 3/6/98, Paso Robles 3/20/98, and Monterey County 3/10/98, to increase grower awareness of and understanding about the uses of the PPS. Ninety-one (91) growers attended these seminars. CCVT gave a presentation and had an exhibit at the Grape Expo in Paso Robles (December, 1998). Over 500 growers attended the Grape Expo. The Team also gave presentations at the Central Coast Wine Grower Association (March, 1999) and the CSU Fresno Viticulture Short Course in Santa Maria (April, 1999). Ongoing presentations were made in both beginning and advanced viticulture courses at Cal Poly, San Luis Obispo.

Literature has been prepared and distributed for CCVT outreach. To date, 400 CCVT Booklets, 250 CCVT Information Tri-Fold Flyers, 250 Sustainable Agriculture Flyers, 100 Cooperating Grower Newsletters, and 750 Winegrape Grower Newsletters have been distributed. Appendix contains examples of each of the materials.

As an educational tool, PPS helps winegrowers pinpoint areas where improvements are needed. Information derived from the PPS evaluation helped participants to direct future efforts in vineyard management and planning in those areas as Team member Richard Smith explains below:

> *After evaluating our operation with the PPS, we learned that the area of soil management needed attention. We have since made a commitment towards improving our soil management program as a priority. Our new cover crop and soil amendment program addresses several issues: low organic matter soils, high erosion fields, water penetration issues, and mite problems. In fact, the results of our efforts have supported our refocused commitments. Our mite problem has been virtually eliminated by controlling dust. Organic matter is increasing and water penetration is improving. Even during El Nino, we experienced minimal erosion. The soil's structural and nutritional health is improved. We have measured positive yield responses, and we have seen improved growth and wood maturity.*

Bob Thomas, Mesa Vineyard Management explains:

> *I have found our involvement with CCVT to be invaluable in identifying our strengths and weaknesses as we attempt to farm in a more environmentally friendly manner. I have experimented with various methods of weed control in an effort to use less pre-emergent herbicides. We have made considerable progress investigating alternatives and understanding their effect on the soil and overall environment. Attending roundtable discussions with other growers and interested members of the community has highlighted areas of concern that I previously had not considered.*

These "testimonials" have become the foundation for written materials, handouts, and presentations in attracting new growers to the Team. The "grower-to-grower" approach continues to be the extension model for outreach.

Group Expansion

Each year Team membership and the participation of new growers have increased. These members include representatives from Beringer Wine Estate, Fetzer Vineyards, and J. Lohr wineries, major producers and buyers of Central Coast wine grapes. A permanent representative from the Paso Robles Vintners and Growers Association also joined the team. Fetzer Winery established the goal of having 100% of their Central Coast growers participating in the evaluation by the end of 1999.

New cooperating growers learned of the program through presentations or word of mouth from current Team members. An aggressive strategy was not utilized to recruit growers. It was hoped that a "soft sell" would be more effective. Experience has shown that this method is effective in recruiting new growers. Interest is expected to continue to expand as the outreach and presentation efforts increase. The hiring of an Executive Director and the resulting visibility she brings will further increase grower interest in the group.

In order to extend and strengthen ties with state, federal, and environmental agencies, the CCVT sought out representatives of organizations who might not otherwise be aware of the efforts of the team. Representatives from the following were invited to and attended team meetings:

- Monterey Bay National Sanctuary Program
- National Fish & Wildlife Foundation
- San Luis Obispo County Health Commission
- Environmental Center of San Luis Obispo
- Community Alliance of Family Farmers
- San Luis Obispo County Agricultural Commissioner

In addition, team members presented copies of the PPS and informed the following regarding the CCVT and its mission & goals:

- EPA
- USDA FAS
- House Agriculture Committee
- USDA APHIS
- National Center for Communicable Disease Control
- USDA Farm Service Agency
- Various U.S. Senate & Representatives staff members

CCVT will continue to invite government representatives, environmental interests, and the press to business meetings, presentations and field days.

Demonstration Blocks

Demonstration vineyards have been established in each county. These vineyards have received high PPS scores and will be the site for tailgate meetings and field days. Each site has specific practices, which can be highlighted: cover cropping, pest monitoring, alternative weed control, soil moisture monitoring, composting, etc. The use of these sites for education and outreach purposes will provide a foundation for grower-to-grower education and specific issues.

PPS Revision

The consultant at several events recorded grower comments and ideas and suggestions were incorporated into the PPS revision.

A new revision will be completed in the fall, 1999 in time for the 1999 evaluations. Team members identified the following as important issues to be incorporated:

1. Techniques to reduce non-point source pollution
2. Farm shop waste containment and recycling of petroleum products
3. Equipment safety programs
4. Oak woodland and wildlife conservation

The CCVT efforts and the PPS are recognized as a model by grower groups in other winegrape growing regions, including the Lodi-Woodbridge Winegrape Commission, and the Amador County Grape Growers Association. These organizations are following CCVT leadership in adopting similar protocols. Recently the Lodi-Woodbridge Winegrape Commission obtained funding to evaluate the use of the PPS within their district.

SUMMARY AND CONCLUSIONS

PPS represents a 1000-point system for quantifying the extent of sustainable vineyard practices utilized. From 1996/98, CCVT conducted 98 evaluations, involving 47 different growers using PPS. Thirty-two blocks were evaluated for multiple years to determine if changes in management practices occurred. Total acreage evaluated exceeded 10,500 acres. Average total scores increased from 750 to 817 from 1996/98. Of the blocks that were evaluated over time 19 scores increased, 6 scores stayed the same, and 7 scores decreased. To be able to quantify changes in block management over time is a remarkable accomplishment of the PPS Monterey County overall scores remained slightly lower than San Luis Obispo and Santa Barbara Counties, but Monterey County saw the largest change in scores from 1996/98. The most significant areas to be addressed include water and soil management—these scores were consistently lower than other categories for each county. Pest management and viticulture scores improved over time and were higher than those of other categories.

CCVT developed an outreach program addressing statewide industry, local traditional growers and local transitional growers. Outreach included publications in Practical Winery and Vineyard, presentations at local vintner meetings, lectures in University viticulture courses, and several handouts. The group continues to utilize the "grower-to-grower" approach in its presentations and materials.

Most significant has been the increased involvement from Central Coast growers, both in the ongoing business of the group and in conducting evaluations. With the addition of a part-time Executive Director, the sphere of the team's influence and extent of outreach will increase.

Central Coast Vineyard Team
Mission Statement: The Central Coast Vineyard Team will identify and promote the most environmentally safe, viticulturally and economically sustainable farming methods, while maintaining or improving quality and flavor of wine grapes. The team will be a model for wine grape growers and will promote the public trust of stewardship for natural resources.

Table 10. Positive Points System

Category	Total Possible Points
Pest Management	200
Soil Management	200
Water Management	200
Viticultural Management	200
Wine Quality	100
Continuing Education	100
Total	**1,000**

Rate your vineyard on a **per-block** or **farming-unit** basis.

I. PEST MANAGEMENT

OBJECTIVE: The vineyard pest management situation is dynamic. Pest outbreaks, pest resistance problems and new sampling and monitoring techniques require that each grower determine the safest and most effective practices for his/her particular vineyard. The objective is to understand which pests can cause damage and under what conditions damage is likely to occur. An Integrated Pest Management program includes regular inspection of vines for pests or injury, use of the best crop management practices that prevent pest buildups or damage, and responsible use of control techniques that are applied only when necessary.

A. Insect Monitoring/Management/Control

GOAL: To use sustainable farming methods that minimize insect buildups or damage to vines and crop, minimizing the need for-pesticide treatment. If grapes can be grown without broad-spectrum insecticides, take full points (51) for Section A.

7 points	1.	Are you familiar with the insect pests found (and likely to be found) in your vineyards?
4 points	2.	Are you knowledgeable about the life cycles of your vineyard pests?
4 points	3.	Are you familiar with the natural predators and beneficial insects that prey upon or parasitize your pest species?
4 points	4.	Do you track or have access to weather data and degree-days during the season?
4 points	5.	Is there a regular monitoring program in place to detect the presence and determine population dynamics of vineyard pests?
4 points	6.	When possible, are alternate host plants of a pest species removed (i.e. Bermuda grass and elderberry for sharpshooter leafhoppers; mustard for orange tortrix)?
4 points	7.	Is the type cover crop chosen according to the nematode situation (i.e. root lesion or citrus nematodes choose blando brome or barley--winter cover crops that inhibit these nematodes)? If your vineyard does not have these nematodes, take the 4 points.
4 points	8.	Are pheromone traps, sticky tape or sticky cards used to trap and monitor insects?
4 points	9.	Are sprays timed to control the appropriate insect brood hatch for maximum effectiveness?
4 points	10.	When spraying is needed, do you first opt for the “softer” insecticides or reduced risk materials that are easier on beneficial insects?
4 points	11.	Are selective materials used instead of broad-spectrum insecticides?
4 points	12.	Are “hot” spots in the vineyard identified and used as indicators for spraying decisions (i.e., spraying on a block by block basis, instead of spraying the entire vineyard)

B. Disease Monitoring/Management/Control

Goal: To use sustainable farming methods that minimize incidence and spread of diseases that result in damage to vines and crop, and to work toward reducing the use of chemicals for disease control. If wine quality is maintained by a disease management program where chemical use has been reduced, take full points (31) for Section B.

6 points	1.	Are you familiar with the diseases that are likely to be found in your vineyards?
4 points	2.	Do you know the causal agents of these diseases and their method of spread?
5 points	3.	Are regular scouting programs in place to monitor for the presence and severity levels of diseases that are likely to occur in your vineyards?
4 points	4.	Are the Grape Powdery Mildew Index or Botrytis Disease Pressure Models used to help schedule spray applications?
4 points	5.	Is sanitation regularly practiced for those diseases which are spread by infected tissue left in the vineyard (i.e., bunch rot, phomopsis, crown gall)?
4 points	6.	Are cultural practices that deter the spread of disease regularly used (i.e., late pruning for *Eutypa;* avoidance of trunk injury for crown gall; leaf removal for *Botrytis, cinerea*)?
4 points	7.	Is a weather station, weather data logger, max-min thermometer or rain gauges in your vineyard, and are they used as tools to modify cultural practices?

C. Weed Monitoring/Management/Control

Goal: To use sustainable farming methods that minimize weed growth that competes with vines or harbors diseases or insects. If wine quality is maintained by a vineyard floor management program where chemical weed control methods are minimized, take full points (44) for Section C.

7 points	1.	Are you familiar with the weed species that grow in your vineyard?
5 points	*2..*	*Are mechanical methods of in-row weed control used (i.e., weed badger, french plow, bezzerredi, clemens weeder)?*
4 points	*3.*	*Do you manage natural vegetation in the vineyard middles as a cover crop?*
4 points	4.	Do you manage your cover crop up for weed suppression?
4 points	5.	Are most problematic weeds treated at a time when they are most susceptible to the herbicide (i.e. glyphosphate on field bindweed at flowering)?
5 points	6.	Is a systemic, contact herbicide material used as a spot treatment instead of spraying the entire berm or the strip in the vine row?
6 points	7.	Where soil leaching is a problem, have you discontinued the use of triazines or other problematic herbicides that may leach into the groundwater (i.e. simazine)?
5 points	8.	When herbicides are used, is the application rate adjusted to your weed pressure?
4 points	9.	When herbicides are used, do you consider your soil type when determining application rate?

D. Beneficials Recognition/Monitoring/Releases/Habitat

Goal: To keep aware of the latest information on biological controls for grape pests to be able to recognize the beneficial insect species in your own vineyard. If wine quality is maintained by conservation or release of beneficial insect species for pest management take full points (29) for Section D.

7 points	1.	Are you familiar with the beneficial insects that naturally occur in your growing region?
7 points	2.	Do you monitor populations of your beneficial insects or the degree of parasitism on pests in your vineyard?
5 points	3.	Are year-round habitat or refuges provided to encourage the presence of beneficial insects (i.e., French prune trees for *Anagrus epos;* cover crop for spiders)?
5 points	4.	Are beneficial insects released in your vineyard as an alternative to needed pesticide treatments?
5 points	5.	Are owl or raptor refuges provided for bio-control of rodents?

E. Other

4 points	1.	Have you sealed or do you regularly water your vineyard roads for dust abatement?
4 points	2.	Are exclusion methods used for vertebrate pest control (i.e., deer fence; wire mesh cylinders or grow tubes around new vines; bird netting)?
4 points	3.	Is the sprayer routinely calibrated and are worn nozzles and screens replaced in order to insure the best coverage and efficacy of agricultural chemical applications?
4 points	4.	When making a spray application, is the tractor driven at the proper speed to optimize coverage?
4 points	5.	Are pesticides with different modes of action alternated within the seasonal spray program in order to minimize the risk of the pest resistance problems?
25 points	6.	Do management practices, pest monitoring programs, and IPM practices allow you to avoid the use of Category 1 or Restricted Materials? (See Appendix for list of Category 1 and Restricted materials.) If so, take 25 points.

II. SOIL MANAGEMENT

OBJECTIVE: Good stewardship of the land and soil is a prerequisite to good farming. Soil structure and nutrient content affect vine health and vigor. A healthy vine can often tolerate more pest damage or better compete with weeds than a less healthy one. The objective is to conserve or improve naturally occurring beneficial soil characteristics and use best management practices to correct any deficiencies in soil tilth, water or nutrient status.

A. Soil Monitoring/Plant Analysis

Goal: To conserve and maintain the naturally occurring chemistry and fertility of the soil that promotes vine growth; and to detect potential imbalances (e.g., toxicities, deficiencies) that may deter vine growth. If you have begun or are maintaining a soil and plant monitoring program that includes all the components take full points (36) for Section A.

8 points 1. Is the soil periodically sampled and tested for nutrient content (i.e., NO_3^-, NH_4^+, P, K^+, Ca^{+2}, Mg^{+2}, organic matter content)?

7 points 2. Do you routinely monitor your soil's pH, EC (electrical conductivity), and toxicities (i.e., Na^+, Cl^-, B)?

7 points 3. Do you have an annual program of bloomtime petiole collection for plant nutrient analyses?

7 points 4. If the vines have nutritional problems, have you correlated your soil tests to your leaf petiole tests?

7 points 5. Do you have aerial photographs of your vineyard site (either infra-red or standard film) and use them in vineyard management decisions?

B. Pre-Plant Soil Structure Modification

Goal: To correct soil-related impediments to vine health and growth prior to planting. If you detect soil-related problems and corrected them before planting take full points (25) for Section B.

5 points 1. Before planting, did you have your soil tested for pH, salinity, caution exchange capacity (CEC) and soil-borne pests?

4 points 2. If the soil was alkaline or saline, was gypsum $CaSO_4$ applied; or if your soil was acidic, was limestone $Ca(CO_3)_2$ applied to help neutralize the acidity?

4 points 3. Were backhoe pits dug prior to planting to analyze the soil profile and used to determine possible physical impediments to root growth?

4 points 4. If the soil harbored vine pests, was it planted to a non-host crop or allowed to lay fallow to reduce the pest populations previous to vineyard planting?

4 points 5. If there were physical impediments to root growth or water permeability problems in this block, did you deep-rip, slip plow or install a tile drainage system to correct it?

4 points 6. If necessary, was organic matter incorporated into the soil prior to planting?

C. Post Plant Soil Structure Modification

Goal: To correct soil-related impediments to vine health and growth and to reduce farming practices that contribute to deterioration of soil structure. If you have a program to promote and maintain good soil structure in your vineyard, take full points (22) for Section C.

4 points	1.	Is a permanent cover crop maintained in your vineyard?
5 points	2.	Do your soil management practices promote good tilth and a friable soil?
5 points	3	Are back hoe pits dug periodically in order to monitor vine root growth and/or soil structure?
4 points	4.	Do you follow up on the results of the back hoe pits and take corrective measures if needed?
4 points	5.	Do you use tractors and/or vineyard equipment that minimize soil compaction, such as high floatation tires or track-layers?

D. Erosion Control

Goal: To conserve soil stability and eliminate erosion and offsite movement of sediments. If you have eliminated erosion take full points (34) for Section D.

7 points	1.	Do you know your soil series, or have you consulted with your local USDA Natural Resource Conservation Service office to determine your soil series and its respective erosion hazard?
6 points	2.	Do you know the permeability and runoff rates of your soils and do you irrigate accordingly?
6 points	3.	Is a winter cover crop maintained for erosion control?
5 points	4.	If your vineyard is on a steep slope, do you cultivate or work the soil across the slope?
5 points	5.	If you have a hillside vineyard, do you have water diversions on the longer slopes to transport the runoff safely?
5 points	6.	Have you developed a cultivation plan that minimizes the number of tractor passes per season?

E. Cover Crop

Goal: To preserve or improve soil structure and soil nutrient content, conserve soil stability and eliminate erosion, reduce dust related programs and provide habitat for beneficial insects with the effective use of a cover crop. If you plant and maintain cover crops take full points (28) for Section E.

6 points	1.	Is a cover crop encouraged or planted in vine row middles?
5 points	2.	If your vineyard has a nitrogen requirement, is your cover crop a nitrogen-fixer (clovers, vetches, legumes, etc.)? If your vineyard has no nitrogen requirement, take the 5 points.
6 points	3.	Is your cover crop an effective habitat for beneficial insects?
6 points	4.	Have you reduced mite pressure where you maintain a cover crop that effectively keeps the dust level down?
5 points	5.	If you need to reduce vine vigor, do you manage a cover crop to do so?

F. Amendments

Goal: To promote and maintain high levels of biodiversity in soil microbiology or correct deficiencies which may affect soil chemistry, water holding capacity or nutrient holding capacity. If you have improved soil organic matter levels and maintained a balanced soil chemical status take full points (27) for Section F.

9 points	1.	Is any organic matter added to the soil, such as compost, manure, pomace, municipal green waste?
6 points	2.	Is green manure from your cover crop incorporated into the soil?
6 points	3.	If the soil is alkaline or saline, is gypsum $CaSO_4$ applied?
6 points	4.	If the soil is acidic, is limestone $Ca(CO_3)_2$ applied to help neutralize the acidity?

G. Composting

Goal: To divert agricultural organic or municipal green wastes into vineyard soil in order to benefit soil tilth and health. If you are producing compost for your vineyard take full points (28) for Section G.

7 points	1.	Is winery pomace included in the vineyard composting program?
7 points	2.	Is green waste diverted from the waste stream to your composting program (i.e. municipal green waste, other crop or food processing residues)?
7 points	3.	Do you effectively manage your fresh organics into compost by using effective composting techniques, such as application of moisture, turning, and temperature monitoring?
7 points	4.	Do you support commercial compost programs by purchasing compost?

III. WATER MANAGEMENT

OBJECTIVE: Good water management results in healthy vines, enhances resistance to pests, improves weed control, promotes uniform maturation of the crop and is a responsible use of a natural resource. An effective program in monitoring of water quality and distribution uniformity can lead to the conservation of water resources and quality while meeting vine water needs. A well designed and maintained on-farm water management system prevents off-site water movement and non-point source pollution of surface and ground water.

A. Monitoring Water Quality

Goal: To monitor water quality, water resources available for irrigation, and energy efficiencies of the water application system. If you keep records of water quality and well and pump performance tests, take full points (28) for Section A.

14 points	1.	Do you periodically have your water tested for pH, electrical conductivity (EC), sodium adsorption ratio (SAR), nitrates (NO_3^-), sodium (Na^+), chlorides (Cl^-), and boron (B) levels?
14 points	*2.*	*Do you periodically have your well(s) tested for pump energy efficiency, and monitored for changes in water yield (gallons per minute) and drawdown?*

B. Off-Site Water Movement

Goal: To prevent off-site movement of rain, irrigation water and sediments, and to eliminate non-point source pollution of surface waters. If you have eliminated off-site movement of water take full points (28) for Section B.

6 points	1.	Do your irrigation practices minimize run off?
5 points	2.	Are prevention techniques in place for containment of any irrigation or rainfall run off?
5 points	3.	Are devices in place to divert water away from public roads (sprinkler guards, flow channels)?
6 points	4.	Is a subsurface drainage system in place where needed?
6 points	5.	If there is a soil permeability problem, have amendments been used to improve water infiltration?

C. Irrigation System Efficiency Maintenance

Goal: To use available water resources in the most efficient and uniform manner possible. If your irrigation system is operating at peak efficiency take full points (56) for Section C.

8 points	1.	Is a low-volume system (e.g. drip) used for irrigation?
8 points	2.	Is a low volume system (e.g. pulsators) used for frost control? If no frost control system is required, take the 8 pts.
8 points	3.	Do you routinely test the irrigation system for distribution uniformity and application efficiency by monitoring emitter outflows and pressure differences across a block?
7 points	4.	If drip irrigation is used, is the irrigation efficiency (beneficial use as compared to amount of water applied) at 90% or better?
7 points	5.	Are water filters regularly inspected and cleaned?
5 points	6.	Are irrigation lines regularly flushed out?
5 points	7.	If required, is chemical maintenance of your irrigation system performed in order to prevent plugging?
8 points	8.	Are there flow meters on the wells or other pumps to monitor water usage over the season?

D. Irrigation Scheduling And Amount

Goal: To achieve the most beneficial use of applied irrigation water while conserving water resources and eliminating non-point source pollution of groundwater. If you use and record the water budget method in your vineyard take full points (64) for Section D.

8 points	1.	Do you know the effective rooting depth of your soils?
8 points	*2.*	*Do you know the amount of water available in your soil profile at budbreak?*
7 points	3.	Do you record seasonal rainfall?
8 points	4.	Are monitoring devices used to track soil moisture depletion (i.e., gypsum blocks, neutron probes, tensiometers)?
8 points	5.	Are Evapotranspiration (ET) calculations used as one of the tools to determine irrigation requirements, and is an ET budget followed for the season? (ET data is available through CIMIS, California Irrigation Management Information System 1-800-92CIMIS, or 1-800-922-4647.)
8 points	6.	If your soil builds up salts, do you know your leaching requirements? If you have no salinity problems, take the 8 points.
7 points	7.	Is water conservation practiced, for example, irrigating at night when the ET demand is at its lowest?
10 points	8.	Where past local experience has indicated improved wine quality may result, have you experimented with deficit irrigation timings?

E. Fertilization/Fertigation

Goal: To apply required fertilizers in the most efficient manner and eliminate non-point source pollution of groundwater. If you have optimal fertilizer use efficiency through the use of fertigation take full points (24) for Section E.

6 points	1.	Are leaf petiole analysis results used as a guide, and vine vigor and fruit quality considered when making fertilizer application decisions?
6 ponits	2.	If fertilization is needed, do you fertilize by injection (fertigate) into your irrigation system?
6 points	3.	Is water quality analysis considered prior to choosing fertilizer materials in order to prevent plugging of the irrigation system?
6 points	4.	If you fertigate, are back-flow prevention devices in place to protect against contamination of water sources?

IV. VITICULTURAL MANAGEMENT

OBJECTIVE: Decisions made prior to establishment of a vineyard may result in production practices which are environmentally safe and sustainable. Many vineyard insect and disease problems can be reduced or avoided by making informed choices prior to planting.

A. Spacing/Orientation/Density

Goal: To establish a vineyard which uses natural conditions to promote a healthy microclimate within the canopy and conservation of soil and water resources within the block. If you have matched your vineyard design to the site conditions take full points (50) for Section A.

12 points 1. Did you consider disease management when laying out your row orientation?
12 points 2. Is the spacing matched to the potential vine vigor?
12 points 3. Did you consider erosion hazard when choosing row orientation?
14 points 4. Was wine quality a consideration in the orientation/spacing decision?

B. Rootstock/Scion/Clone

Goal: To select a rootstock and scion that will eliminate the need for chemical or cultural intervention to correct a problem with vine vigor, a pest problem, or an environmental condition that would impact either vine health or wine quality. If you have matched the vineyard site to rootstock/scion combinations take full points (50) for Section B.

8 points 1.Are disease and/or pest resistant rootstocks planted?
7 points 2. Are certified plant materials used?
7 points 3. Were the soil characteristics considered when rootstock(s) were chosen?
6 points 4. Is the scion matched to your growing region?
6 points 5. Do you have a rootstock trial on your site, or have you used information obtained from a similar site (other grower or U.C. trials) when making your rootstock choices?
6 points 6. Do you have a clonal selection trial on your site, or have you used clonal information obtained from a similar site when making your scion choices?
10 points 7. If you have trials on your vineyard, is the fruit from your trials harvested and vinified separately for later evaluation?

C. Trellising

Goal: To use the optimum trellis design to balance vine capacity and wine quality. If you have matched your trellis system to local conditions and rootstock/scion vigor take full points (50) for Section C.

10 points 1. Is a trellis system used that accommodates your vine vigor?
10 points 2. Is a trellis system used that promotes good canopy microclimate (i.e., improved sunlight exposure or air movement)?
10 points 3. Have you modified or retrofitted your existing trellis system in order to improve canopy microclimate and improve wine quality?
20 points 4. Do you have a trellis trial plot, or have you used data from local trials to determine which trellis system is the best suited to your site for wine quality improvement?

D. Canopy Management

Goal: To monitor the canopy microclimate to insure sound and quality fruit. To take corrective actions to improve the canopy microclimate when existing conditions may adversely affect vine health or wine quality. If you have improved the wine quality of your fruit through effective canopy management techniques take full points (50) for Section D.

8 points	1.	Is your **canopy microclimate** monitored (light meters, atmometers, leaf wetness/relative humidity/temperature sensors)?
8 points	2.	Is the fruit-to-pruning weight ratio between the range of 5-10?
10 points	3.	Do you rate or score your canopy pre-harvest (i.e., evaluate sunlight exposure, count number of leaves per clusters, R. Smart vineyard scoring system, point quadrant)?
8 points	4.	Is shoot density managed to promote fruit separation, i.e., shoot thinning, shoot positioning, sterile shoot removal where needed?
10 points	5.	Where needed, are you removing leaves in the fruit zone to reduce disease, pests or improve wine quality?
6 points	6.	Is pruning adjusted to keep each vine in balance (fruit/foliage)?

V. WINE QUALITY

OBJECTIVE: The very best wine quality attainable is the ultimate achievement. Harvest is the culmination of an entire year of work in the vineyard and the condition of the fruit upon arrival at the winery is a critical part of the process.

A. Meet Contract Parameters

Goal: To provide the winery with grapes in the best possible condition. If your fruit meets or surpasses the winery's expectations, take full points (50) for Section A.

When your fruit is delivered to the winery:

8 points	1	Is the grape Brix within specified contract optimum?
8 points	2.	Is the juice pH within specified contract optimum?
8 points	3.	Is the Material Other than Grapes (MOG) content below specified contract amount?
8 points	4.	Is the percent rot or mildew in the fruit below specified contract amount?
10 points	5.	Do you know what block(s) each load of fruit was picked from?
8 points	6.	Prior to harvest, are you able to provide the winery with a reasonably accurate crop projection?

B. Taste "Your Wine"

Goal: To understand that wine quality is founded in the vineyard. The grower, and the winemaker, work together to produce a particular wine style. If you and the winemaker work as a team in producing the best wines possible from your vineyard, take full points (50) for Section B.

10 points 1. Do you taste and evaluate the wines from your vineyard?

10 points 2. After step B1 above, are you able to determine which of your viticultural practices contributed positively to wine quality?

20 points 3. If wine quality needs to be improved, are you attempting to determine which of your viticultural practices can be altered in order to achieve wine quality improvement?

10 points 4. Do you regularly confer with the winemaker or winery representative and have him/her in your vineyard to discuss all of the above?

VI. CONTINUING EDUCATION

OBJECTIVE: To learn and to stay aware of the latest developments in one's field is crucial to career and personal growth. One must constantly strive to keep informed and remain current. Techniques in grapegrowing are changing and improving; therefore, the grape grower and winemaker must also change and improve.

A. Grower

Goal: To remain abreast of the latest developments by reading journals, listening to peers and participating in meetings. If you are fluent with the latest in grape growing and pest management techniques, take full points (33) for Section A.

7 points 1. Do you regularly attend UCCE, CAWG, ASEV and other industry meetings, seminars and symposiums to keep up to date on grape growing and winemaking issues?

7 points 2. Do you subscribe to and read farming, trade and industry journals (i.e., American Journal of Enology and Viticulture, Practical Vineyard and Winery, American Vineyard)?

7 points 3. Do you have current membership in local growers' and vintners' associations and attend the meetings to keep informed on local issues?

12 points 4. Do you own and use a copy of Grape Pest Management, 2nd Edition, UC DANR Publication 3343 ?

B. Employee

Goal: To promote the vineyard as a safe and desirable place to work. The grower must be concerned about the health, safety and continuing education of his/her employees. The employee is an integral part of the team that successfully works together to produce quality wine grapes and quality wines.. If you are in full compliance, have incentive programs in place that promote education and reward employee safety, take full points (35) for Section B.

5 points 1. Do you have **full compliance** with all Department of Pesticide Regulation (DPR), Worker Protection Standard (WPS), SB 198 and Cal-EPA laws and regulations?

5 points 2. Do you routinely hold employee safety and training meetings; stressing topics such as the importance of personal hygiene and daily change of clean clothing, safe use and handling of pesticides, and pesticide use notification?

5 points 3. Are your employees encouraged to be team members that contribute to and share the responsibilities of producing quality wine grapes?

5 points 4. California law requires education of employees regarding mandatory re-entry intervals (REIs) stated on the pesticide label. If you **did not** have to take disciplinary action against either employees or supervisors for violations of any re-entry intervals , take 5 points.

5 points 5. Do you offer incentives or have an employee safety "rewards" program in place that recognizes and appreciates individuals for safe job performance ?

5 points 6. Are your employees each trained to be pest/disease scouts to help with monitoring in the field?

5 points 7. Do you regularly hold informal employee meetings to discuss your growing philosophies and long and short-term work goals?

C. Winemaker (Customer)

Goal: Public perception of grapegrowing is an important part of marketing wine. Promotion of the positive aspects of winegrape growing is essential. If you are working to improve the image of grape growers and their craft, take full points (32) for Section C.

11 points 1. Do you provide full pesticide use reporting to the winery on a monthly basis?

11 points 2. Are you involved with the Growers' and Vintners' Associations that strive to educate the public about IPM and sustainable agricultural practices in the vineyard?

10 points 3. Are you a part of an aggressive marketing program that educates and promotes the positive image of the Central Coast Vineyard Team and its Positive Points System Protocol, especially in the tasting rooms?

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APPENDICES

EPA Category I materials (signal words **Poison / Danger**) and Restricted materials currently registered for use on wine grapes:

- Insecticides
  - Azinphos-methyl (Guthion)
  - Carbaryl (Sevin)
  - Endosulfan (Thiodan)
  - Fenbutatin-oxide (Vendex)
  - Methyl parathion
  - Methomyl (Lannate)

- Soil Applied
  - 1,3-Dichloropropene (Telone II)
  - Carbofuran (Furadan)
  - Fenamiphos (Nemacur)
  - Metam sodium (Vapam)
  - Methyl bromide (Brom-o-gas)
  - Chloropicrin

- Herbicides
  - Paraquat (Gramoxone)

- Baits
  - 4-Amino Pyridine (Avitrol)
  - Aluminum phosphide (Phostoxin)
  - Strychnine

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